

**REMARKS/ARGUMENTS**

This is in response to the Final Office Action of June 30, 2004, on which the shortened statutory period for response expires on September 30, 2004. Accordingly, this Response is timely filed. The Commissioner is authorized to charge Deposit Account No. 50-0675, Order No. 861975/0270 for any fees in connection with this Response.

Claims 1-8 are currently pending in the application. Applicant respectfully requests that the Examiner enter the requested corrections to the application as described below. No new matter has been added.

**I. Claim Rejections – 35 U.S.C. § 102(b)**

The Examiner has rejected Claims 1, 3-4, 7 and 8 as being anticipated by Wainauski, U.S. Patent No. 4,834,617. Applicants, by this Response, have amended these rejected claims to distinguish the claimed invention over the prior art cited by the Examiner. It is therefore respectfully submitted that these rejections should be withdrawn in view of the following remarks.

**A. An Impeller is not a Propeller**

Rejecting the above claims under 35 U.S.C. 102(b), the Examiner asserts that the Applicants have not provided a special meaning to the word "impeller" and that those of ordinary skill in the art would define an impeller as "any device capable of inducing a pressure differential to a working fluid or reacting to a working fluid pressure differential." Based on this definition, the Examiner asserts that "a blade for an impeller" does not exclude blades such as propellers. Based on the following discussion, however, Applicants respectfully submit that one of ordinary skill in the art would understand that the term "impeller" has a narrower meaning than that asserted by the Examiner, and the recitation of this term *per se* distinguishes the device from a propeller

The McGraw-Hill Dictionary of Engineering defines an impeller as "[t]he rotating member of a turbine, blower, fan, axial or centrifugal pump, or mixing apparatus." In contrast, the definition of a propeller from the same dictionary is a "bladed device that rotates on a shaft to produce a useful thrust in the direction of the shaft axis." A copy of the relevant pages of the dictionary are submitted on a form PTO/SB/08B, filed concurrently with this Response, in

compliance with MPEP § 609(III)(C(3)). Applicant respectfully requests that the Examiner consider the submission in as part of Applicants' reply to the Office Action in the absence of a statement under 37 CFR 1.97(e) and the fee set forth in 37 CFR 1.17(p).

In agreement with these definitions, one of ordinary skill in the art would understand that an impeller is a stationary device for pumping air or fluid from one side of the impeller to another, whereas a propeller is a moving device that propels the structure to which it is attached through air (such as an aircraft) or fluid (such as a ship or submarine). Indeed, Applicants respectfully submit that the usage of the term "impeller" is a clear signal to one of ordinary skill in the art that the Applicants are specifically distinguishing the present device from a propeller.

Additionally, the disclosure of Wainauski and the specification of the present application support these definitions and their distinction. As recited in the specification at paragraph 2, "[t]he present invention relates to an axial flow fan...especially suitable for use in cooling electronic components." (Emphasis added.) As recited in the specification at paragraph 2, the design of the present invention has "the advantages of decreasing the axial width of the axial flow fan while maintaining its performance and design constraints." In contrast, Wainauski is directed to a propeller for use in a jet engine that provides "high loading and high efficiency at relatively high Mach numbers." [Col. 1, ll. 34-37.] Applicants respectfully submit that one of ordinary skill in the art would understand that a jet aircraft propeller whose blade tips travel at close to the speed of sound when in flight employs different design principles than a compact fan that blows air over electronic components. Accordingly, Applicants respectfully disagree with the Examiner's bases for his assertion that the meaning of "impeller" in the claimed fan is so broad as to encompass the almost supersonic jet engine propeller disclosed in Wainauski. Accordingly for these reasons, Applicants respectfully disagree with the Examiner's rejections of Claims 1, 3-4, 7 and 8, and respectfully submit that the Examiner's rejections are overcome and the claims are in condition for allowance.

B. Claims 1, 3-4, 7 and 8

Rejecting independent Claims 1, 3-4, 7 and 8 under 35 U.S.C. 102(b), the Examiner asserts that Wainauski teaches the elements of the impeller blades recited these claims. Even though Applicants disagree with the Examiner's interpretation of "impeller," Applicants have herein amended these claims to explicitly recite that the blades are for an "impeller of an axial

fan" notwithstanding Applicants' submission that the term "impeller" *per se* distinguishes the invention over Wainauski. As discussed above in the previous section, Wainauski does not teach blades for the impeller of an axial fan but instead discloses propeller blades of a jet engine.

The amendments have been made to the preambles of the claims, and Applicants respectfully submit that they provide a structural limitation in keeping with MPEP §2111.02. As discussed above, the fan blades disclosed in the specification blow air over electronic components, whereas the propeller blades in Wainauski are designed to operate in a jet engine. The design parameters and considerations of the two types of blades are therefore strikingly dissimilar, as described in the previous section.

Accordingly, Applicants respectfully disagree with the Examiner's rejections of Claims 1, 3-4, 7 and 8, respectfully submit that the amended Claims 1, 3-4, 7 and 8 overcome the Examiner's rejections, and respectfully submit that these claims are in condition for allowance.

## **II. Claim Rejections – 35 U.S.C. § 103(a)**

The Examiner has rejected Claims 2, 5, and 6 under 35 U.S.C. § 103(a) as being unpatentable over Wainauski. It is respectfully submitted that this rejection should be withdrawn in view of the following remarks.

### **A. Claim 2**

Rejecting independent Claim 2 under 35 U.S.C. 103(a), the Examiner asserts that Wainauski teaches a maximum blade thickness of approximately 36% chord and a maximum blade camber at approximately 74% chord. The Examiner further asserts that it would have been an obvious matter of design choice to change the chord positions to between 16%-23% for the maximum thickness and between 40%-51% for the maximum camber. Applicants respectfully disagree with the Examiner and submit that Claim 2 as amended is in condition for allowance.

As discussed above in relation to Claims 1, 3-4, 7 and 8, the fan blades disclosed in the specification blow air over electronic components, whereas the propeller blades in Wainauski are designed to operate in a jet engine. The design parameters and considerations of the two types of blades are therefore strikingly dissimilar. One of ordinary skill in the art of designing compact fans for cooling electronic components would not look to the jet engine literature for a design to adapt for cooling use, especially not at blades that are designed to have tips moving close to the

speed of sound. Consequently, the thickness and camber of the blades are not a design choice as the environments, fluid mechanic, and performance considerations of the two designs are radically different.

Indeed, as stated in the specification at paragraph 60, the most important parameters and constraints of the design of the present invention are "the volumetric flow rate and axial width fan size." The design parameters of the airfoils disclosed in Wainauski are "high loading and high efficiency at relatively high Mach numbers," "less susceptible to foreign object damage," and "easy to handle and construct." [Col. 1, ll. 34-43.] Wainauski goes on to state that "each airfoil section has a unique location of maximum thickness and camber..." [Col. 7, ll. 27-28; emphasis added.] Accordingly, one of ordinary skill in the art would view the uniqueness of the Wainauski design to be just that - unique, and thus inapplicable to the design of a compact cooling fan.

Moreover, Claim 2 as amended includes the structural limitation that the blade is that of an impeller of an axial fan. As discussed above in relation to amended Claims 1, 3-4, 7 and 8, Wainauski does not teach blades for the impeller of an axial fan but instead discloses propeller blades of a jet engine. Consequently for all the foregoing reasons, the Examiner has not met his initial burden of proving a *prima facie* case of obviousness. Accordingly, it is respectfully submitted that Examiner's rejection of independent Claim 2 as being unpatentable over Wainauski has been overcome.

B. Claims 5 and 6

Since Claim 5 depends on independent Claim 3, and therefore includes all the limitations of Claim 3, Wainauski also does not disclose the blade for an impeller of an axial fan present in Claim 3 and therefore also Claim 5. Wainauski only discloses a propeller for a jet engine as discussed above. Also as discussed above in relation to Claim 2, one of ordinary skill in the art would not consider it a design choice to modify the unique design of the Wainauski jet propeller into a fan blade. Accordingly, Applicants respectfully submit that the Examiner has not met his initial burden of proving a *prima facie* case of obviousness of Claim 5, respectfully submit that the Examiner's rejection is overcome, and respectfully submit that the amended Claim 5 is in condition for allowance.

Further, since Claim 6 depends on independent Claim 4, and therefore includes all the limitations of Claim 4, Wainauski also does not disclose the blade for an impeller of an axial fan present in Claim 4 and therefore also Claim 6. Wainauski only discloses a propeller for a jet engine as discussed above. Also as discussed above in relation to Claim 2, one of ordinary skill in the art would not consider it a design choice to modify the unique design of the Wainauski jet propeller into a fan blade. Accordingly, Applicants respectfully submit that the Examiner has not met his initial burden of proving a *prima facie* case of obviousness of Claim 6, respectfully submit that the Examiner's rejection is overcome, and respectfully submit that the amended Claim 6 is in condition for allowance.

### III. Conclusion

In view of these remarks, Applicant respectfully requests that the application be passed to issue in due course. The Examiner is urged to telephone Applicant's undersigned counsel at the number noted below if it will advance the prosecution of this application, or with any suggestion to resolve any condition that would impede allowance. In the event that any extension of time is required, Applicant petitions for that extension of time required to make this response timely. Kindly charge any additional fee, or credit any surplus, to Deposit Account No. 50-0675 Order No. 861975/0270.

Respectfully submitted,

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Dated: September 30, 2004